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nuptial flight. This histolysis does not begin simultaneously or advance with equal rapidity in all of these muscles and hence among fascicles apparently intact may be found those in which the degeneration is in various degrees of completeness or even terminated. Janet states that throughout the process there is no phagocytosis, or ingesting of solid particles by leucocytes. The wing muscles are finally completely replaced by adipocytes which, he believes, arise from leucocytes.

W. A. R.

**Notes on Entomological Literature.**—*The Green Pigment of Locustidæ.*—Podiapolsky<sup>1</sup> has studied both the chemical and the spectroscopic peculiarities of the green pigment extracted from the wings of *Locusta viridissima*. He was able to separate a yellow and a green pigment completely parallel to, if not identical with, the xanthophyll and the chlorophyllan of plant-green. The paper is very suggestive as regards methods.

W. A. R.

*Inner Metamorphosis of the Trichoptera.*—Much as the caddis flies have been studied from the biological and the systematic view point, comparatively little is known regarding their histologic structure, and practically nothing concerning their inner metamorphosis. Lubben's extended contribution<sup>2</sup> is therefore especially welcome. The author discusses the changes in the respiratory system, the sexual organs, and the alimentary canal. The work has not been limited to a single species but treats of a wide series and brings together many interesting details.

W. A. R.

*Starving out the Codling Moth.*—Under this caption Fabian Garcia of the New Mexico Agricultural Experiment Station issues a call to fruit growers to exterminate the codling moth in a single season! The late frosts of last April left little pome fruit in the territory: if fruit growers will but cooperate in the destruction of what little remains (which will all be worthless anyway because all will be wormy) and will destroy also all wild rosaceous fruit and walnuts, the codling moth, being deprived of its food, will be eradicated. The optimism

<sup>1</sup> Podiapolsky, P. '07. Über das grüne Pigment bei Locustiden. Zool. Anz. xxxi pp. 362-366.

<sup>2</sup> Lubben, H. '07. Über die innere Metamorphose der Trichopteren. Zool. Jahrb. Anat. xxiv, pp. 71-128, pls. 11-13.

of the plan, its faith in the applicability of laboratory results by the public, undaunted by the contemplation of the inertia of the human species, is delightful.

J. G. N.

*Fossil Insects*.—The four parts of Handlirsch's *Die Fossile Insekten*<sup>1</sup> now at hand (640 pages and 36 double plates) suffice to show that this is a work of first importance to every student of fossil insects. In bringing together and making accessible descriptions and figures of practically all the known fossils (at least, in the older strata, thus far treated), and in correlating the fragmentary knowledge of them with keen morphological insight, the author is rendering good service. Though not all his more radical changes in groupings are likely to prove acceptable, and though the multiplicity of new groups of all grades will seem at first confusing, all will agree that the collective result of the work is substantial progress. Hitherto few monographers of insect orders have noticed the fossil representatives of the orders. There will be less excuse for the neglect of the paleontological evidence in the future.

J. G. N.

*A Catalogue that is in part a Monograph*.—The sons of the late Baron de Selys Longschamps of Liege are building a worthy monument to the memory of their father in the issuance of a catalogue of his zoological collections. The first number that comes to hand (Fascicle xvii, Cordulines, by M. R. Martin) shows that this, for the Odonata at least, is to be a great monograph. This small subfamily of dragonflies containing fewer than 140 species, is described on 94 quarto pages, illustrated by 99 (mostly multiple) text figures and three colored plates. The text figures are admirably executed and are sufficient for all practical purposes. The colored plates add little of real value, although they greatly increase the cost of the work. To every special student of the dragon-flies, this work will be indispensable because of its comprehensive character and its general excellence.

J. G. N.

<sup>1</sup> Handlirsch, A. *Die Fossile Insekten, und die Phylogenie der rezenten Formen*. Leipzig. Wilh. Engelmann.

*Berlese's Entomology*.—Fascicles 21–22 (pp. 585–648) of Berlese's magnificent work<sup>1</sup> are just at hand. They conclude the discussion of the nervous system and begin that of the organs of special sense. Like the preceding fascicles these are not mere compilations but are rich in new facts for the student of insect morphology.

W. A. R.

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## BOTANY

**The Fungi of Termite Nests.**—We are accustomed to think of Belt's classic observations on the leaf cutting ants of South America as the beginning of our knowledge of the relationships between ants and fungi, but Petch<sup>2</sup> assures us that Sweathman in 1781, nearly a century before Belt's discoveries, stated that in tropical Africa some species of termites had chambers in their nests in which grew a kind of fungus used by the ants as food. Although the "fungus gardens" of the true ants of tropical America have been quite fully described, we have had until the present time no comprehensive treatment of the similar habits in the termites of the Eastern Hemisphere. Petch brings together and tests by his own extensive studies of the Ceylonese species, the scattered observations on this subject.

Ceylon does not afford such variety of form and size of termites as Australia and Africa, but the nests of *Termes redmanni* and *T. obscuriceps*, the only two species which Petch studied, are abundant everywhere except in the highest districts. The ant hills, roughly conical in form, are only about six feet high. Their upper portion is continued into one or more hollow conical structures called chimneys. The form of the nests varies greatly; they may slope gradually to the top of the chimneys, they may branch into several chimneys or they may have a solid apex and bear the chimneys at the side. They are built of earth and grains of sand brought up from the interior of the nest and cemented together by a secretion of the termites. A large portion of every nest is underground. In the early stages of development the presence of a nest is usually indicated by three or four chim-

<sup>1</sup> Berlese, A. Gli insetti, loro organizzazione, sviluppo, abitudini e rapporti coll. uomo. vol. 1. Milan. Società Editrice Libreria.

<sup>2</sup> Petch, T. The Fungi of Certain Termite Nests. *Ann. Roy. Bot. Gard. Peradeniya*, 3: 185–270, pl. 5–21. 1906.